MYCOLOGIA

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ILLUSTRATIONS OF FUNGI—XVI

WILLIAM A. MURRILL

(WITH PLATES 102–108)

The accompanying figures represent some of the tough and woody fungi known as polypores. Most of the species of this group grow on dead wood in brackets of various sizes and shapes, the fruiting surface being composed of tubes or furrows. Sometimes the walls of these tubes split with age and the hymenium appears spiny, resembling the hydnums; sometimes the furrows change with age to appear like gills. When the fruit-body is perennial, the tubes are often arranged in layers. The family may be divided into four groups, the resupinates, the annual poroid species, the perennial poroid species, and the agaric-like species. The resupinate species are difficult for the beginner; some of the larger species of the other groups are comparatively easy. Polypores as a class are very destructive to trees and timber. On the other hand, one species possesses medicinal properties, some of the encrusted species supply tinder, and several of the more juicy ones are excellent for food if collected when young. The only species recognized as poisonous is the medicinal one, *Fomes Laricis,* and it is so tough and bitter that no one would think of eating it.

Coriolus versicolor (L.) Quél.

MANY-COLORED CORIOLUS

Plate 102

Pileus densely imbricate, very thin, sessile, dimidiate, conchate, 2–4 × 3–7 × 0.1–0.2 cm.; surface smooth, velvety, shining, marked

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with conspicuous, glabrous zones of various colors, mostly latericeous, bay or black; margin thin, sterile, entire; context thin, membranous, fibrous, white; tubes punctiform, less than 1 mm. long, white to isabelline within, mouths circular to angular, regular, even, 4–5 to a mm., edges thick and entire, becoming thin and dentate, white, glistening, at length opaque-isabelline or slightly umbrinous; spores allantoid, smooth, hyaline, 4–6 × 1–2 μ.

Abundant everywhere on dead wood, both in temperate and tropical regions, causing decay in tree trunks and often producing root-rot in trees when they are weakened by lack of food or other unfavorable conditions. The photograph is from a young black birch attacked by the fungus.

Coriolus prolificans (Fries) Murrill

LACERATE CORIOLUS

Plate 103

Pileus exceedingly variable, sessile or affixed by a short tubercle, dimidiate to flabelliform, broadly or narrowly attached, 2–5 × 2–6 × 0.1–0.3 cm.; surface finely villose-tomentose, smooth, white or slightly yellowish, marked with a few narrow, indistinct, latericeous or bay zones; margin thin, sterile, entire to lobed; context very thin, white, fibrous; tubes 1–3 mm. long, white to discolored within, mouths angular, somewhat irregular, 3–4 to a mm., usually becoming irpiciform at an early stage, edges acute, dentate, becoming lacerate, white to yellowish or umbrinous; spores smooth, hyaline.

Exceedingly abundant at times on dead deciduous trunks from Canada to Florida and west to Wisconsin and Mexico. I have seen oak trunks nearly a hundred feet long entirely covered with the fruit-bodies of this species. The walls of the tubes usually split at an early stage, causing beginners to mistake it for an *Irpex* or a *Hydnum*.

Irpiciporus mollis (Berk. & Curt.) Murrill

SOFT IRPICIPORUS

Plate 104

Pileus sessile, dimidiate, imbricate, decurrent, 3–4 × 4–8 × 1–3 cm.; surface white, finely pubescent, azonate, sulcate at times,

often aculeate behind with age; context white, coriaceous, 1–5 mm. thick; tubes soon splitting into teeth, which are 1–2 cm. long, compressed to subulate, slender, more or less pointed, dentate or incised, puberulent to glabrous, white to pale-flesh-colored, about 1 mm. apart at the base; spores globose, smooth, hyaline, 5–7 μ.

This species occurs rather sparingly on dead deciduous wood in temperate North America. It is interesting because of its close resemblance to the Hydnaceae. The specimens figured were collected on the Garden grounds in August, 1911, growing on the dead top of a red maple fifty feet above the ground.

Poronidulus conchifer (Schw.) Murrill

SHELL-BEARING POLYPORE

Plate 105. Upper Figure

Pileus thin, coriaceous, dimidiate to flabelliform, usually narrowly attached, conchate, springing from a sterile, cup-like structure, which usually appears on the mature sporophore near the base, 1.5–2 × 2–4 × 0.1–0.2 cm.; surface white to isabelline, with pale-latericeous zones, finely tomentose to glabrous, the sterile portion avellaneous, with narrow, black, concentric lines; margin thin, concolorous, undulate; context very thin, membranous, white, less than 1 mm. in thickness; tubes short, about 1 mm. long, thin-walled, white, mouths angular, irregular, 3 to a mm., edges thin, uneven, dentate; spores ellipsoid, smooth, hyaline.

Very common on fallen branches and dead limbs of elm throughout eastern North America as far west as Kansas. The genus is monotypic and is peculiar in having the fertile portion of the fruit-body develop from a sterile, cup-like growth, which is often found on the back of the mature pileus.

Scutiger griseus (Peck) Murrill

GRAY SCUTIGER

Plate 105. Lower Figure

Pileus circular, often irregular, convex, 7–12 cm. broad, 1 cm. or less thick; surface glabrous or minutely tomentose, cinereous, slightly darker toward the center; margin thin, concolorous, often

incurved on drying, irregular, undulate to lobed; context soft-fleshy, rosy-gray, about 5 mm. thick; tubes slightly decurrent, 1–2 mm. long, whitish-stuffed when young, white to pale-umbrinous within, mouths subangular, unequal, 2–4 to a mm., edges thin, entire to fimbriate, lacerate with age, white when young, becoming gray or umbrinous; spores subglobose, hyaline, echinulate, 5–6 × 4.5–5 μ; stipe central, thick, short, bulbous at the base, with surface and substance resembling that of the pileus, but darker in color, 4–5 cm. long, 1–1.5 cm. thick.

Found sparingly on the ground in open woods in New York, New Jersey, and Alabama. The specimens here figured were collected by Dr. F. M. Bauer near Amityville, Long Island, in September, 1911. The genus *Scutiger* approaches very near the Boletaceae, but the species are somewhat tougher and dry more easily. Of the dozen or more members of the genus in this country, all except two are very rare and local.

Grifola frondosa (Dicks.) S. F. Gray

FRONDOSE POLYPORE

Plate 106. Upper Figure

Pileus imbricate-multiplex, 15–40 cm. in diameter; pileoli very numerous, branching from a common trunk, imbricate or confluent, variable in size and shape, dimidiate to flabelliform, 1.5–6 cm. broad; surface smoky-gray, fibrillose, radiate-striate; margin thin, undulate or lobed, strongly inflexed when dry; context white, very thin, tough, fragile, having the odor of mice; tubes white, 2–3 mm. long, mouths circular and regular when young, 3 to a mm., often large and angular with age, edges white, thin, entire to lacerate; spores subglobose to ellipsoid, smooth, hyaline; stipe tubercular, white, connate-rimose.

This large, branched species grows commonly in Europe and North America at the base of oak trees or arises from their roots, on which it feeds. It also attacks the roots of chestnut trees, and in the Italian chestnut orchards it is often allowed to destroy its host because it is much esteemed in that region for food. It must be eaten when young or it will become too tough.

Daedalea quercina Pers.

OAK-LOVING BRACKET-FUNGUS

Plate 106. Lower Figure

Pileus corky, rigid, dimidiate, sessile, imbricate, applanate, convex below, triangular in section, 6–12 × 9–20 × 2–4 cm.; surface isabelline-avellaneous to cinereous or smoky-black with age, slightly sulcate, zonate at times, tuberculose to colliculose in the older portions; margin usually thin, pallid, glabrous; context isabelline, soft-corky, homogeneous, 5–7 mm. thick; tubes labyrinthiform, becoming nearly lamellate with age in some specimens, 1–2 cm. long, 1–2 mm. broad, chalk-white or discolored within, edges obtuse, entire, ochraceous to avellaneous.

This species is common on oak stumps and timbers throughout Europe and temperate North America, and is conspicuous by reason of its size and peculiar labyrinthiform fruiting surface, which becomes almost agaric-like with age.

Elfvingia megaloma (Lév.) Murrill

ARTISTS' BRACKET-FUNGUS

Plate 107

Plate 108. Upper Figure

Pileus hard, woody, dimidiate, applanate, 6–15 × 8–30 × 1–4 cm.; surface milk-white to gray or umbrinous, glabrous, concentrically sulcate, encrusted, fasciate with obscure lines, conidia-bearing, usually brownish during the growing season from the covering of conidia; margin obtuse, broadly sterile, white or slightly cremeous, entire to undulate; context corky, usually rather hard, zonate, fulvous to bay, 5–10 mm. thick, thinner with age; tubes very evenly stratified, separated by thin layers of context, 5–10 mm. long each season, avellaneous to umbrinous within, mouths circular, 5 to a mm., whitish-stuffed when young, edges obtuse, entire, white or slightly yellowish to umbrinous, quickly changing color when bruised; spores ovoid, smooth or very slightly roughened, pale-yellowish-brown, truncate at the base, 7–8 × 5–6 μ.

Originally described from specimens collected by Ménand in New York City. Found in great abundance throughout temperate North America on dead or diseased trunks or timber of most

deciduous trees, and on conifers in some sections. The tulip-tree here figured bore a number of new brackets each season for several years, while the older ones increased in size. Within the trunk of the tree, the delicate branching threads of the fungus permeated the wood in all directions seeking food and causing decay. In 1912, the tree was found to be so weakened that it had to be cut.

The brackets of this fungus are often collected by amateur artists and used for etching. The accompanying figure is from a specimen recently presented to the Garden by Mr. George E. Pollock. It grew near Lake Placid over one hundred years ago and was etched by a friend of the late James Ten Eyck to represent a view near the latter's camp in the Adirondacks.

Fomes ungulatus (Schaeff.) Sacc.

HOOF-SHAPED FOMES. PINE-LOVING FOMES

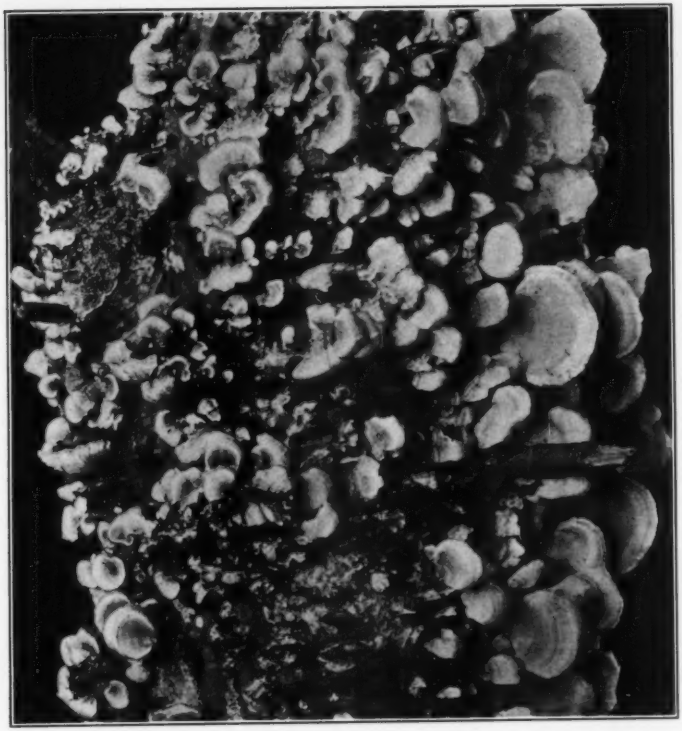
Plate 108. Lower Figure

Pileus corky to woody, ungulate, 8–15 × 12–40 × 6–10 cm.; surface glabrous, sulcate, reddish-brown to gray or black, often resinous; margin at first acute to tumid, pallid, becoming yellowish or reddish-chestnut; context woody, pallid, 0.5–1 cm. thick; tubes distinctly stratified, 3–5 mm. long each season, white to isabelline, mouths circular, 3–5 to a mm., edges obtuse, white to cream-colored; spores ovoid, smooth, hyaline, 6 μ.

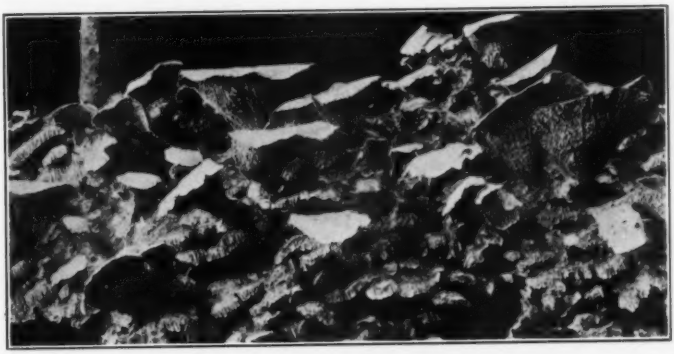
A large species widely distributed in temperate regions on coniferous trees, such as pine and hemlock, and found more rarely on certain deciduous trees growing near its usual hosts.

NEW YORK BOTANICAL GARDEN.

CORIOLUS VERSICOLOR (L.) Quél.



View of upper surface



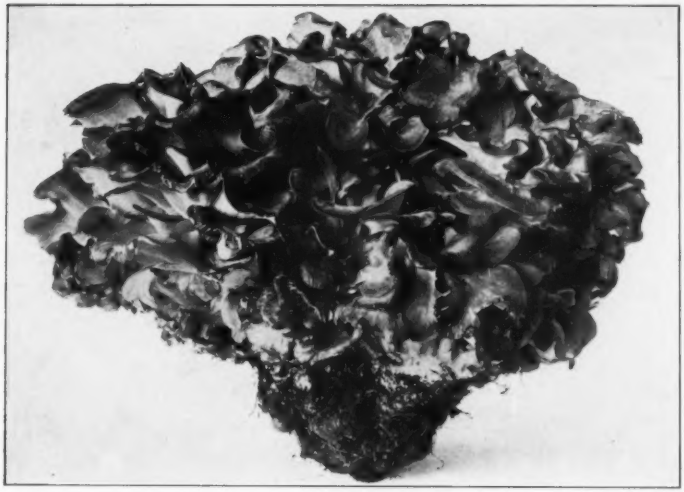
View of lower surface

CORIOLUS PROLIFICANS (Fries) Murrill

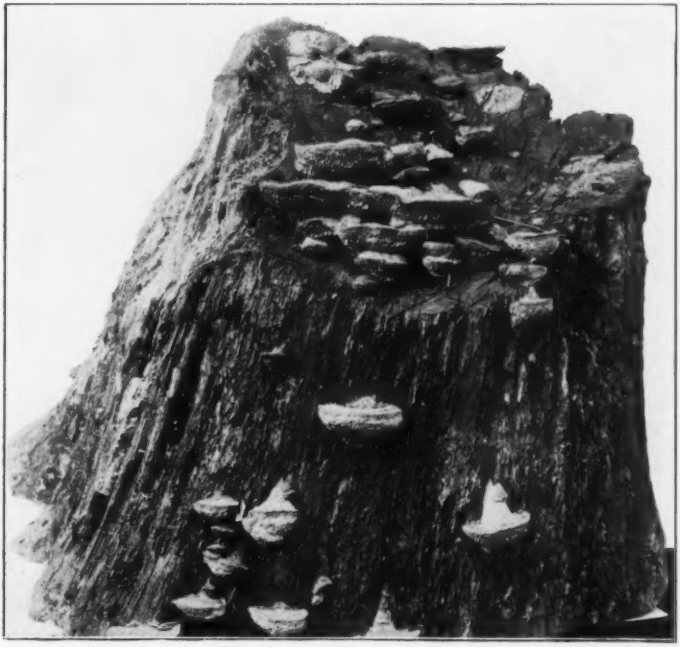
IRPICIPORUS MOLLIS (Berk. & Curt.) Murrill

PORONIDULUS CONCHIFER (Schw.) Murrill

SCUTIGER GRISEUS (Peck) Murrill

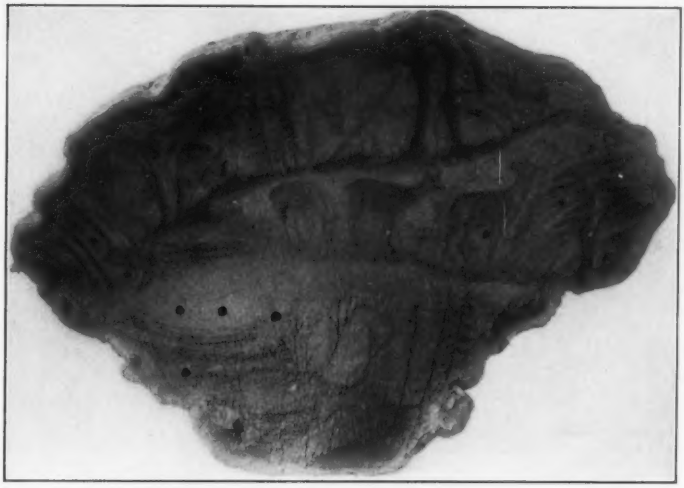


GRIFOLA FRONDOSA (Dicks.) S. F. Gray

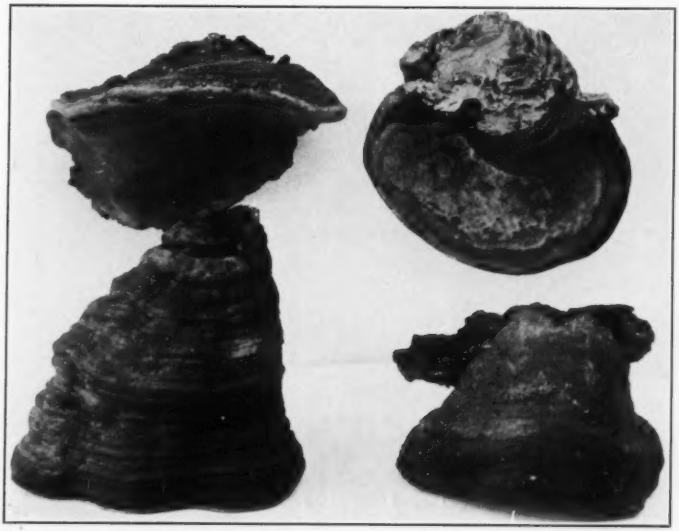


DAEDALEA QUERCINA Pers.

ELFVINGIA MEGALOMA (Lév.) Murrill



ELFVINGIA MEGALOMA (Lév.) Murrill



FOMES UNGULATUS (Schaeff.) Sacc.

TYPE STUDIES IN THE HYDNACEAE—VI. THE GENERA CREOLOPHUS, ECHINODONTIUM, GLOIODON, AND HYDNODON[1]

HOWARD J. BANKER

CREOLOPHUS P. Karsten, Medd. Soc. Faun. et Fl. Fenn. 5: —— (28). 1879

Climacodon P. Karsten, Rev. Myc. 3[1]: 20. 1881.

The genus *Creolophus* Karst. was established on *Hydnum corrugatum* Fr. as the type. No type specimen of this species was found at Upsala but several specimens in the herbarium collected by P. A. Karsten, E. Th. Fries, and Fr. Kjellman in Sweden and Finland were referred to this species. All of these agree perfectly with Fries's description and may be regarded as authentic representatives of the species.

They do not appear to be generically different from *H. septentrionale* Fr., having much the same form, color, and fleshy or subfleshy substance. The species has not yet been positively recognized as an American form.

Climacodon Karst. was established on *Hydnum septentrionale* Fr. and is, therefore, a metonym of *Creolophus.*

We have hitherto included the species of this genus in the genus *Steccherinum.* The peculiar fleshy or subfleshy character of the substance of these plants, so strikingly different from the dry and tough fibrous character of typical *Steccherrinum,* has convinced us that they should be maintained in a separate genus for which a name has already been provided by Prof. Karsten.

Creolophus septentrionalis (Fries)

Hydnum septentrionale Fries, Sys. Myc. 1: 414. 1821.

There is no type of this species preserved at Upsala, but forms of the plant often found on beech in Indiana conform perfectly

[1] Investigation prosecuted with the aid of a grant from the Esther Herrman Research Fund of the New York Academy of Science.

in every respect to the figure given by Fries, Icon. *pl. 9, 10.* A fine, large specimen was found at Upsala that had grown on *Tilia* in the Botanical Garden. It differs from what appears to be the typical form of the plant in that the whole mass is much more elongated vertically, probably from its having emerged from a crack, and the pilei are smaller, thinner, and more numerous. Specimens reported in this country as growing on maple differ in some respects from the typical form on beech.

Creolophus agaricoides (Swartz)

Hydnum agaricoides Swartz, Prodr. 149. 1788.
Hydnum discolor Fries, Sys. Myc. **1**: 411. 1821.

Swartz's type of *H. agaricoides* could not be located in Europe nor could a specimen of *H. discolor* Fr. be found in Fries's herbarium at Upsala: the species did not appear to be known there. Strangest of all, nothing was found in Berkeley's herbarium at Kew that in any way answered to his elaborate discussion with figures of this species in the Annals and Magazine of Natural History **10**: 380. *pl. 10. f. 9.*

In 1909, Murrill and Harris discovered in the remarkable Cockpit country of Jamaica a plant that appears to answer in every essential feature the descriptions of Swartz and of Berkeley. As this region is the type locality of Swartz's species and as the specimen, *Murrill and Harris 1095,* conforms so well to Swartz's species and to no other, there seems to be the best of reasons for regarding it as representing the Swartzian species. It is the only specimen of the species that I know of and is preserved in the herbarium of the New York Botanical Garden.

Creolophus pulcherrimus (Berk. & Curt.)

Hydnum pulcherrimum Berkeley and Curtis, Hooker's Jour. Bot. and Kew Garden Misc. **1**: 235. 1849.
Hydnum friabile Fries, Nov. Symb. Myc. 106. 1855.

The type of *Hydnum pulcherrimum* B. & C. is preserved in the Berkeley herbarium at Kew and is marked "*Hydnum pulcherrimum* B. & C. No. 1648. Santee River." The specimen is in

good condition and shows clearly that the species is our common American form.

At Upsala a specimen was found marked "*Hydnum pulcherrimum* Berk. & Curt. *H. friabile* Fr. ad *Liquidambar* dejecit. Carol. austr. M. A. Curtis." The handwriting was that of Curtis. Is this specimen the type of *H. friabile* Fr.? There was no other specimen found at Upsala named *H. friabile*. This specimen was certainly a good example of *H. pulcherrimum* B. & C. As Fries himself expressed doubt as to the species being distinct we are justified in regarding them as the same species.

ECHINODONTIUM Ellis and Everhart, Bull. Torrey Bot. Club **27**: 49. Feb. 1900

Hydnofomes Hennings, Engler's Bot. Jahrb. **28**: 267. Mar. 1900.
Hydnophysa Clements, Genera of Fung. 108. 1909.

The genus *Echinodontium* Ell. & Everh. was established on *Fomes tinctorius* Ell. & Everh. Bull. Torrey Club **22**: 362. 1895. This species was originally described from a specimen received from Alaska and known as "Swan 20851." The type specimen is now preserved in the herbarium of the New York Botanical Garden. It has the teeth broken off even with the pileus and hence was described as a *Fomes*. Later, on obtaining more perfect specimens and discovering the hydnaceous character of the plant, Ellis established the genus *Echinodontium* for the species.

Hydnofomes Henn. was established on *H. tsugicola* Henn. & Shir., Engler's Bot. Jahrb. **28**: 268. Mar. 1900. The species and genus were described from specimens collected at Nikko in Japan by Prof. Shirai and now preserved in the herbarium at Berlin. These specimens are smaller than the type of *Echinodontium tinctorium* Ell. & Everh. and appear to have a somewhat pendant habit; otherwise they do not appear to differ from our American species. It seems possible that the specimens are not typical of the species. The difficulties of transportation might readily account for the sending of undersized and perhaps poorly developed specimens. Until further collections in Japan show conclusively that the species is distinct from the American form, it seems necessary to regard the Japanese plant as the same species

as the American. The habitat and distribution of the plants give confirmation to this view. *Hydnofomes* Henn. must then be regarded as a synonym of *Echinodontium* Ell. & Everh.

Hydnophysa Clements is an unwarranted and a careless attempt to improve upon the name *Hydnofomes* Henn. It may be claimed that the change is in the interests of literary taste in dispensing with a hybrid name. If such be the ground for the proposed change, it seems rather far-fetched and pedantic; for while such considerations doubtless should have weight and be heeded by an author in the coining of a new name, it is by no means a sufficient reason for disturbing an established system of nomenclature. The proposed change is further unwarranted since the name *Hydnophysa* does not have the same significance as *Hydnofomes* and the change does violence to the purpose of the author of the genus. It is evident that Hennings intended to express by his name a relationship between *Hydnum* and *Fomes,* and, under the circumstances, such relationship could not be better expressed by the name. Since *Hydnophysa* suggests no such connection, the change defeats Hennings's purpose. A biologist ought to be the last to object to hybridism when it throws any light on the problems of the relationship of living things. The mistake that Ellis made in referring the Swan specimen to *Fomes* confirms the appropriateness of Hennings's name.

The proposal of the name *Hydnophysa* was also made carelessly and without sufficient investigation of the problem involved; for, although on the same page the name *Echinodontium* was noted by Clements and especially mentioned as included in *Hydnum,* there was a complete failure to perceive that it was generically identical with *Hydnofomes.* From which it is evident that a work claiming not to be critically taxonomic is no place for proposing important changes in nomenclature.

GLOIODON P. A. Karsten, Medd. Soc. Faun. et Fl. Fenn. **5**: 28. 1879

Sclerodon P. A. Karsten, Finlands Basidsv. 360. 1889.
Leaia Banker, Mem. Torrey Club **12**: 175. 1906.

A study of the European types concerned with this genus confirms the conclusions of a former paper on the nomenclature of

the group.[2] There need only be added here a brief account of the types still available in European herbaria. In Persoon's herbarium at Leyden were found two specimens, one marked "*Hydnum parasiticum* Pers. Syn." and the other marked "*Hydnum strigosum* Swartz. ——— *parasiticum* Pers. Syn.," both apparently in Persoon's hand. The latter was much the better specimen and showed clearly the peculiar characters which distinguish this genus. In Berkeley's herbarium, at Kew, there was found an abundant supply of material under the label "*Hydnum stratosum* Berk. Ohio No. 279," showing that the plant is precisely as we have previously treated it.

A reëxamination of Schweinitz's specimen in his herbarium in the Philadelphia Academy of Science shows it to be a distinct form from the type of this genus. Schweinitz referred it to *Hydnum strigosum* Swartz, but the hymenium appears to be distinctly poroid and I am inclined to think it should be referred to *Inonotus hirsutus* (Scop.) Murr.

Hydnodon gen. nov.

Hymenophore pileate, expanded, irregular; surface plane, orange to red; substance fleshy, thin, drying hard and brittle; stipe deformed; teeth short, stout, deformed, tuberculoid, reddish; spores minute, whitish, clouded, echinulate.

Hydnodon thelephorum (Lév.)

Hydnum thelephorum Lévéille, Ann. Sci. Nat. III. **2**: 204. 1844.
Thelephora padinaeformis Montagne, Syll. Crypt. 175. 1856.
Hydnum lateritium Massee, Kew Bull. **1907**: 124. 1907.

In the herbarium at Paris is a specimen marked "*Hydnum thelephorum* Lév. Ann. Sc. Nat. 3 ser. tom. II. p. 204. Cayenne. Lév." It seems probable that this specimen is the type specimen of the species. It agrees perfectly with specimens in the New York Botanical Garden collected in Jamaica, *Murrill 691*, and in the Bahamas, *Brace 4833*. The species is very distinct and well marked, not at all likely to be confused with anything else. In fact, so peculiar are its characters that it has seemed necessary to

[2] Banker, Mycologia **2**: 7. 1910.

treat it as the type of a new genus. The spore characters show a relationship to *Phellodon, Auriscalpium* and *Gloiodon,* but the substance and structure of the pileus show more of an affiliation with *Hydnum.*

Thelephora padinaeformis Mont. is represented in the herbarium of the Paris Museum by a specimen marked "*Thelephora padinaeformis* Mont. Crypt. Guy. No. 401. Guyane Francaise. Legonier No. 914 (1850)." It seems altogether probable that this is the type specimen. It is precisely the same form as Léveillé's specimen. There are with this several other specimens of the same species also collected in Guyane Francaise which are much larger and show the characters of the plant remarkably well. It it a unique species, *sui generis.*

I have not seen the type of *H. lateritium* Mass., but his description appears to indicate the above species in every particular. Massee's specimens were from the "Gold Coast," Africa, and give an interesting extension of the distribution of this species.

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THE GENUS PSEUDOPLECTANIA

F. J. Seaver

(With Plates 109 and 110)

The genus *Pseudoplectania* was founded by Fuckel and originally included the two species, *P. nigrella* and *P. fulgens*. The latter species was later removed from the genus by Saccardo and made the type of a new genus *Otidella*. Two additional species, *P. melania* and *P. stygia*, were, however, added to the genus at this time. One of these, *P. stygia*, is probably a synonym of the older species, *P. nigrella*. If we retain *P. fulgens* in the genus, it then contains three valid species all of which are known from North America. The following is a synopsis of our present knowledge of the genus in North America.

Pseudoplectania Fuckel, Symb. Myc. 324. 1869

Caloscypha Boud. Bull. Soc. Myc. Fr. **1**: 103. 1885.
Otidella Sacc. Syll. Fung. **8**: 99. 1889.
Melascypha Boud. Hist. Class. Discom. Eu. 56. 1907.

Plants gregarious or scattered, sessile or stipitate, large, fleshy, externally clothed with short, slender, flexuous and often coiled or twisted hairs, sometimes giving to the exterior of the cup a tomentose appearance; asci cylindric-clavate, 8-spored; spores perfectly globose, smooth, hyaline; paraphyses straight or curved.

Type species, *Peziza nigrella* Pers.

Key to the Species

Plants entirely black or brownish black.
- Plants long-stipitate, sparingly clothed with straight or slightly flexuous hairs. — *P. vogesiaca.*
- Plants short-stipitate or sessile and densely clothed with coiled hairs. — *P. nigrella.*

Plants orange or occasionally with a greenish tint about the outer margin. — *P. fulgens.*

Pseudoplectania vogesiaca (Pers.)

?*Peziza fuscocana* Alb. & Schw. Conspect. Fung. 312. 1805.
Peziza vogesiaca Pers.; Moug. & Nest. Stirpes Crypt. 584. 1818.
Peziza melania Pers. Myc. Eu. **1**: 239. 1822.
Peziza melaena Fries, Syst. Myc. **2**: 60. 1822.
Peziza spongiosa Peck, Bot. Gaz. **5**: 35. 1880.
Pseudoplectania melaena Sacc. Syll. Fung. **8**: 165. 1889.
Pulparia spongiosa Sacc. Syll. Fung. **8**: 612. 1889.
Melascypha melaena Boud. Hist. Class. Discom. Eu. 56. 1907.

Plants large, attaining a diameter of 2–3 cm., cup-shaped or occasionally nearly plane, margin more or less wavy, externally black and very sparingly clothed with short, brown, flexuous hairs, stipitate, hymenium dark olivaceous-brown; stem variable in length, often 2–3 cm. and about 3 mm. thick, rooting below by a dense mass of dark brown, coarse hairs, 5–7 μ in diameter, both stem and exterior of the cup often longitudinally wrinkled, giving rise to vein-like markings, the whole plant often resembling a gill fungus; asci cylindric with a very long stem-like base, entire ascus 200–275 $\times$ 16–18 μ; spores 1-seriate, globose with one large oil-drop, at first hyaline, becoming very pale brown, smooth; paraphyses slender, brown and coiled or hooked at their apices, about 3–4 μ in diameter.

On decaying wood among moss, especially *Sphagnum*, in coniferous woods.

TYPE LOCALITY: Europe.

DISTRIBUTION: Vermont to Minnesota; also in Europe.

ILLUSTRATIONS: Boud. Ic. Myc. *pl. 343;* Cooke, Mycogr. *pl. 49, f. 193;* Rabenh. Krypt. Fl. **1**[3]: 1030, *f. 1.*

Cotype material of *Peziza spongiosa* Peck (*Pulparia spongiosa* Sacc.) has been examined and this agrees in every detail with cotype material of *Peziza vogesiaca* Pers. as shown in the accompanying plates. The only other American specimens of this species examined were collected by Macoun in British Columbia, June 4, 1889, and referred to *Peziza spongiosa* Peck. The species has been reported from Minnesota by Miss Daisy Hone[1] as *P. melaena* Fr. It has also been reported from Wisconsin by Dr. B. O. Dodge in a paper now in press.

[1] Minnesota Botanical Studies **4**: 70. 1909.

Peziza fuscocana Alb. & Schw. is claimed to be the same, and, if so, the name has priority. No authentic material of this species has been seen.

PSEUDOPLECTANIA NIGRELLA (Pers.) Fuckel, Symb. Myc. 324. 1869

Peziza nigrella Pers. Syn. Fung. 648. 1801.
?*Peziza stygia* Berk. & Curt. Grevillea **3**: 153. 1875.
Plectania nigrella Karst. Act. Soc. Fauna Fl. Fenn. **2**: 119. 1885.
?*Pseudoplectania stygia* Sacc. Syll. Fung. **8**: 166. 1889.
Otidella nigrella Schr. in Cohn Schles. Kryptfl. 3^2: 48. 1893.
Lachnea nigrella Gill. Discom. 78. (1874?)

Plants gregarious or occasionally closely crowded, sessile or substipitate, at first closed and subglobose, becoming expanded and cup-shaped or nearly plane, hymenium brownish-black, margin often wavy and slightly incurved, externally clothed with very fine hairs, 5 mm. to 1.5 cm. in diameter; hairs very long but usually closely coiled and twisted giving to the exterior of the cup a slightly tomentose appearance, of nearly uniform thickness throughout their entire length, sparingly septate and pale brown, 4–6 μ in diameter; asci cylindric or subcylindric with a long stem-like base, entire ascus often as long as 300–325 μ and about 15 μ in diameter at the thickest point; spores with a large oil-drop or often with several smaller ones, 12–14 μ in diameter; paraphyses enlarged at their apices and filled with brown coloring matter, about 4 μ thick.

On the ground in coniferous woods, among moss, especially *Sphagnum*.

TYPE LOCALITY: Europe.

DISTRIBUTION: New Jersey to Wisconsin, Alabama and Jamaica; also in Europe.

ILLUSTRATIONS: Boud. Ic. Myc. *pl. 344;* Cooke, Mycogr. *pl. 31, f. 120;* Gill. Discom. *pl. 65.*

Peziza stygia Berk. & Curt. differs only in its smaller size and longer stem. A fragment of the Carolina specimen has been examined and it seems doubtful if the species is distinct. Later collections may, however, prove it to be so.

PSEUDOPLECTANIA FULGENS (Pers.) Fuckel, Symb. Myc. 324. 1869

Peziza fulgens Pers. Myc. Eu. **1**: 241. 1822.
Peziza cyanoderma deBary in Rabenh. Fungi Eur. 516. 1863.
Aleuria fulgens Gill. Champ. 41. 1879.
Otidella fulgens Sacc. Syll. Fung. **8**: 99. 1889.
Barlaea fulgens Rehm in Rabenh. Krypt. Fl. 1^3: 930. 1896.
Calossypha fulgens Boud. Ic. Myc. 1908.

Plants cup-shaped, regular or irregular, often unequal sided, substipitate below and attached to the substratum by a dense mass of coarse mycelium which penetrates into the substratum and binds it together; cup 1–2 cm. broad and of about the same depth, hymenium orange, externally paler and usually with a greenish tinge especially about the margin, clothed with poorly developed golden-yellow hairs or hair-like structures; asci cylindric, gradually tapering below; spores 1-seriate, hyaline, smooth, 6–8 μ in diameter; paraphyses rather stout, filled with golden-yellow oil-drops.

On soil in coniferous woods.

TYPE LOCALITY: Europe.

DISTRIBUTION: New York to Wisconsin.

ILLUSTRATIONS: Boud. Ic. Myc. *pl. 319;* Cooke, Mycogr. *pl. 53, f. 209;* E. & P. Nat. Pfl. 1^1: 179, *f. 146, C, D.;* Gill. Champ. *pl. 38.*

NEW YORK BOTANICAL GARDEN.

EXPLANATION OF PLATES CIX AND CX

Plate 109 (upper figure). Cotype material of *Peziza spongiosa* Peck, which is identical with *Pseudoplectania vogesiaca* (Pers.) Seaver. Photographed in dried condition. Natural size.

Plate 109 (lower figure). *Pseudoplectania nigrella* (Pers.) Fuckel. Photographed from fresh specimens collected in a *Sphagnum* bog in New Jersey by Dr. B. O. Dodge. Natural size.

Plate 110. Cotype material of *Peziza vogesiaca* Pers., which was later described as the type variety of *Peziza melania* Pers. Photographed from herbarium specimen. Natural size.

PSEUDOPLECTANIA VOGESIACA (Pers.) Seaver

PSEUDOPLECTANIA NIGRELLA (Pers.) Fuckel

PEZIZA VOGESIACA Pers. (cotype)

INTERNAL AECIA

FREDERICK A. WOLF

(WITH PLATE III)

Among the heteroecious rusts whose hosts grow in swampy situations is a form whose telial stage appears on species of *Scirpus* and whose aecial stage is developed upon one of the mints, *Lycopus virginicus* L. This rust, *Puccinia angustata* Peck,[1] is very abundant, during the month of May, in the vicinity of Auburn, Ala. The aecial sori may appear upon the stems, petioles and leaves, resulting in the hypertrophy of affected tissues. The enlargements upon the stems and petioles seem always to be more prominent than those upon the leaves. It was found upon sectioning the sori, which occurred upon both stems and petioles, that many of them not only possessed aecia which, upon dehiscence, liberate their spores to the exterior of the host, but also those which were entirely internal. In case the affected portions of the host are quite mature the pith cells will have disintegrated, causing the stem to be hollow, and the aecia then open into this cavity. If petioles or younger portions of the stem are affected, certain of the pith cells are broken down and the cluster cups open into the surrounding parenchyma tissue. As far as can be observed these internal cluster cups are similar in origin, structure, size and form to those which are erumpent at maturity. Masses of fungous tissue are present in certain places in which the aecia occur and the mycelium more or less densely ramifies throughout adjacent host tissues. These internal aecia may be so numerous that three or four will be present in a section ten micromillimeters in thickness.

The formation of aecia is usually subepidermal and when they are ready for anthesis they break through the epidermis. In the

[1] For this determination thanks are due Dr. J. C. Arthur, of Purdue University.

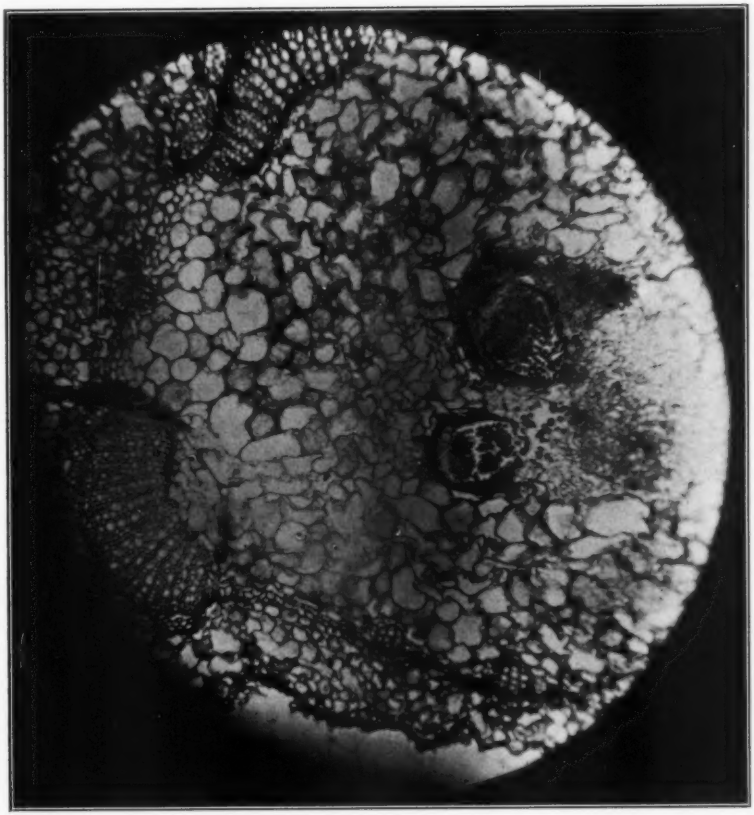
genus *Uredinopsis,* however, the aecia are indehiscent. It seems quite probable, moreover, that in genera which typically open to the exterior the occurrence of internal aecia is not at all uncommon and that this phenomenon has been previously observed by those who have studied rusts. Their occurrence in *Lycopus virginicus,* however, has not previously been recorded. Neither are there published accounts of their presence in other hosts so far as can be learned from the available literature relative to rusts. *Uromyces Caladii* (Schw.) Farl. is known[2] to form internal cluster cups in *Peltandra virginica* (L.) Kunth., and Reddick has observed them too in the fruits of the barberry. Not only it is probable that aecia quite commonly open within affected host tissues but also other stages of rusts as well. *Puccinia graminis* Pers. on rye bears uredinia, some of which liberate the uredospores into the interior of the hollow stems.[3]

A satisfactory explanation of the causes for the production of internal aecia cannot be given at this time further than to state that they must be the same as those which bring about the production of external aecia. In case the cluster cups of *P. angustata* originate near the center of the stem they must of necessity open within the stem. Those more deeply seated might push inward and open toward the center of the stem because there was less mechanical resistance than toward the outside. Rusts, whose spore forms are typically internal, depend upon the weathering away of overlying tissues for the liberation of the spores. The internal aecia of *P. angustata* are to be regarded, however, as the abnormal rather than as the typical condition and the surrounding host tissue cannot then serve this protective function.

ALABAMA POLYTECHNIC INSTITUTE,
AUBURN, ALA.

[2] This observation was made by Prof. G. F. Atkinson, Cornell University, Dr. C. W. Edgerton, La. Exp. Station, and Dr. Donald Reddick, Cornell University, from material collected at Ithaca, N. Y. Thanks are due the above gentlemen for this information so kindly given in letters.

[3] A preparation showing internal uredinia was loaned through the courtesy of Dr. Donald Reddick, Cornell University.



AECIA OF PUCCINIA ANGUSTATA WITHIN THE STEM OF LYCOPUS VIRGINICUS

THE LACTARIEAE OF THE PACIFIC COAST

GERTRUDE S. BURLINGHAM

At the request of Dr. W. A. Murrill, I have undertaken to list the species of *Lactaria* and *Russula* found on the Pacific Coast, as they are represented by specimens in the herbarium of the New York Botanical Garden.

Context lactiferous. 1. LACTARIA.
Context not lactiferous. 2. RUSSULA.

1. LACTARIA Pers. Tent. Disp. Meth. Fung. 63–65. 1797

1. LACTARIA DELICIOSA (L.) Fries, Epicr. 341. 1838

Agaricus deliciosus L. Sp. Pl. 1172. 1753.

Seattle, Washington, *Murrill 387;* Newport, Oregon, *Murrill 1130;* Mill City, Oregon, *Murrill 848;* Corvallis, Oregon, *Murrill 1010;* La Honda, California, *Murrill.*

The specimens from Seattle were collected during the last of October in a peat bog, in holes with skunk cabbage. In Oregon, they were found during the month of November, in fir and pine barrens near the coast and also in the foothills of the Cascade Mountains at an elevation of from 800 to 1,200 ft.

2. LACTARIA CHELIDONIUM Peck, Ann. Rep. N. Y. State Mus. **24**: 74. 1872

Corvallis, Oregon, *Murrill 986,* in fir forest with scattered specimens of oak, birch, willow and maple, November 6–11.

3. LACTARIA SCROBICULATA (Scop.) Fries, Epicr. 334. 1838

Agaricus scrobiculatus Scop. Fl. Carn. **2**: 450. 1772.

Fair Oaks, California, *Harper 48,* in February.

4. LACTARIA TORMINOSA (Schaeff.) Pers. Tent. Disp. Meth. Fung. 64. 1797

Agaricus torminosus Schaeff. Fung. Bav. Icon. **4**: 7 (Index). 1774.
Lactarius villosus Clements, Bot. Surv. Neb. **4**: 20. 1896.

La Honda, California, *Murrill & Abrams 1281.* These specimens were collected in November on the western slope of the Santa Cruz Mountains, in a dense redwood forest below 1,000 feet elevation.

5. LACTARIA INSULSA (Fries) Epicr. 336. 1838

Agaricus insulsus Fries, Myc. **I**: 68. 1821.

Santa Cruz Peninsula, California, near Searsville Lake, *McMurphy 26;* Mission Cañon, California, *Oleson 84.*

6. LACTARIA ZONARIA (Lamarck) Fries, Epicr. 336. 1838

Agaricus zonarius Lamarck, Fl. Fr. **I** (108). 1778.

Fair Oaks, California, *Harper 46,* in February.

7. LACTARIA TRIVIALIS (Fries) Fries, Epicr. 337. 1838

Agaricus trivialis Fries, Obs. Myc. **1**: 61. 1815.
Lactarius deflexus Lindblad, Monogr. Lact. Suec. 8. 1855.

Mill City, Oregon, *Murrill 828;* Searsville Lake, Santa Cruz Peninsula, California, *McMurphy 25.* The specimens from Mill City may be faded specimens of *Lactaria circellata.*

8. LACTARIA CIRCELLATA (Fries) Fries, Epicr. 338. 1838

Agaricus circellatus Fries, Hym. Eur. 426. 1821.

Mill City, Oregon, *Murrill 798;* Glen Brook, Oregon, *Murrill 736.* These specimens were collected in coniferous woods containing some hardwoods, at an elevation of from 400 to 1,200 ft.

9. LACTARIA MUCIDA Burl. Mem. Torrey Club **14**: 56. 1908

Seattle, Washington, *Murrill 539;* Mill City, Oregon, *Murrill 867.*

10. LACTARIA THEIOGALA (Bull.) Fries, Epicr. 342. 1838

Agaricus theiogalus, Bull. Herb. Fr. *pl. 567, f. 2,* 1793; Hist. **1**: 495. 1809.
Lactarius brevipes Longyear, Rep. Mich. Acad. Sci. **3**: 59. 1901.
Lactarius brevix Peck, Bull. N. Y. State Mus. **94**: 33. 1905.

Lactarius xanthogalactus Peck, Bull. Torrey Club **34**: 346. 1907.

Salem, Oregon, *M. E. Peck;* California, *Patterson.*

11. LACTARIA CAMPHORATA (Bull.) Fries, Epicr. 346. 1838

Agaricus camphoratus, Bull. Herb. Fries, *pl. 567, f. 1;* Hist. Champ. 493. 1809.

Santa Cruz Peninsula, California, *Miss Patterson 63;* Pasadena, California, *McClatchie.*

12. LACTARIA SUBDULCIS (Pers.) Fries, Epicr. 345. 1838

Agaricus lactifluus dulcis, Bull. Herb. Fr. *pl. 224, A, B.* 1784.

Agaricus subdulcis Pers. Syn. Meth. Fung. 433, 434. 1801.

Lactarius subserifluus Longyear, Rep. Mich. Acad. Sci. **1901**: 57. 1902.

Corvallis, Oregon, *Murrill 1016;* Marin Co., California, *Eastwood;* in November and December.

13. LACTARIA MITISSIMA Fries, Epicr. 345. 1838

Agaricus mitissimus Fries, Syst. Myc. **I**: 69. 1821.

Seattle, Washington, *Murrill 430;* Mill City, Oregon, *Murrill 805.*

14. LACTARIA GRISEA Peck, Ann. Rep. N. Y. State Mus. **23**: 119. 1873

Seattle, Washington, *Murrill 607.*

15. LACTARIA PIPERATA (L.) Pers. Tent. Disp. Meth. Fung. 64. 1797

Agaricus piperatus L. Sp. Pl. 1173. 1753.

Agaricus Listeri Withering, Nat. Arr. Brit. Pl. **4**: 156. 1801 (Ed. 4).

Mission Cañon, Santa Barbara, California, *Oleson 123.*

16. LACTARIA VELLEREA (Fries) Fries, Epicr. 340. 1838

Agaricus vellereus Fries, Syst. Myc. **I**: 76. 1821.

Mission Cañon, Santa Barbara, California, *Oleson 123.*

The collection numbered *123* contains both specimens of *Lactaria piperata* and *Lactaria vellerea.*

2. RUSSULA (Pers.) Fries, Epicr. Myc. 349. 1838

1. RUSSULA DELICA Fries, Epicr. Myc. 350. 1838

Hypophyllum album, Paulet & Lév. Ic. Champ. 33. 1855.
Russula deliciosa Schröt. in Cohn, Krypt. Fl. Schles. 549. 1889.
Russula brevipes Peck, Ann. Rep. N. Y. State Mus. **54**: 178. 1901.

Seattle, Washington, *Murrill 372, 378;* Corvallis, Oregon, *Murrill 994;* Preston's Ravine, near Palo Alto, California, *Murrill & Abrams 1204;* La Honda, California, *Murrill & Abrams 1279;* Santa Barbara, California, *Oleson 111.*

There has been more or less uncertainty regarding the identity of *Russula delica* Fries, arising from the fact that in his earlier descriptions he refers to the pileus as "nitidus," shining; but in a later work[1] he does not mention this characteristic. The gills do not always impress one as distant, but it is noticeable that in the dried specimens the gills are really set far apart. Fries also did not mention the occurrence of a greenish tinge on the gills, but Kauffman[2] notes that the specimens which he has seen growing around Stockholm, and which Romell refers to *Russula delica,* often have this characteristic. The greenish tint on the edges of the gills in the American plants is not generally noticeable until the mushroom is fully mature, and gills which show no sign of the color when gathered often become greenish-gray during the process of drying; the color, however, vanishes before the plant is dry. Fries says that *Russula delica* is similar to *Lactaria vellerea* and often confused with it, which would seem to indicate that *Russula delica* sometimes might give the impression of being tomentose. Our specimens do occasionally appear obscurely fibrillose in places as though the surface fibers had pulled apart from each other. *Lactarius exsuccus* Smith probably should be referred to *Russula delica.*

The Seattle number, *372,* is noted as having greenish gills.

2. RUSSULA NIGRICANS (Bull.) Fries, Syst. Myc. **I**: 60. 1821

Agaricus nigricans, Bull. Herb. Fr. *pl. 212.* 1784.
Russula nigrescens Krombh. pt. 9. *27.* 1831.

[1] Monogr. Hymen. Suec. **2**: 185. 1863.
[2] Rep. Mich. Acad. Sci. **11**: 65. 1909.

Corvallis, Oregon, *Murrill 1012;* Newport, Oregon, *Murrill 1098.* These specimens were collected in mixed forests of fir, oak, willow and maple, in November, 1911. Number *1012* reached 15 cm. in diameter.

3. RUSSULA DRIMEJA Cooke, Grevillea **10**: 46. 1881

Seattle, Washington, *Murrill 654,* collected late in October.

4. RUSSULA GRANULATA Peck, Ann. Rep. N. Y. State Mus. **53**: 843. 1900

Presidio, California, *Harper 68,* March 12, 1911.

5. RUSSULA EMETICA Fries, Epicr. Myc. 357. 1838

Newport, Oregon, *Murrill 1063;* California, *Harper.*

6. RUSSULA VETERNOSA Fries, Epicr. Myc. 354. 1838

Mission Cañon, Santa Barbara, California, *Oleson 87,* under oaks, April 15, 1913.

7. RUSSULA TURCI Bres. Fungi Trid. 22. 1881

Seattle, Washington, *Murrill 640;* Corvallis, Oregon, *Murrill 1007.* These were found in fir forests mixed with maple and birch. In *640,* the pileus reached the diameter of 9 cm.

8. RUSSULA CHAMELEONTINA Fries, Epicr. Myc. 363. 1838

Seattle, Washington, *Murrill 686;* La Honda, California, *Murrill & Abrams 1271.*

The La Honda specimens were found growing in a dense redwood forest, November 25, 1911, below an elevation of 1,000 ft.

9. RUSSULA ABIETINA Peck, Ann. Rep. N. Y. State Mus. **54**: 160. 1901

Seattle, Washington, *Murrill 275,* in deep coniferous woods.

10. RUSSULA OBSCURA Rom. Öfvers. k. Vetensk.-Akad. Förhandl. 179. 1891

Seattle, Washington, *Murrill 602,* under fir, hemlock, maple, late in October.

11. RUSSULA ALUTACEA Fries, Epicr. Myc. 362. 1838

Agaricus alutaceus Fries, Syst. Myc. **I**: 55. 1821.

Tacoma, Washington, *Murrill 721.*

These specimens which I am referring to *Russula alutacea* differ from the description in two respects; the pruinose gills and the unfading pileus. Upon comparison with better foreign material than I have yet been able to obtain, it may be possible to clear away any doubt. They were abundant along the border of a lake in deciduous and evergreen forests. The pileus is broad, depressed, slimy, with separable pellicle, very dark purple-black, up to 15 or more cm. broad, with an even margin; the gills are cream-colored, avellaneous when dry and dusted with spores, sinuate; stipe equal, rose-colored, 10 cm. long, 2.5–3 cm. thick; spores yellow, broadly ellipsoid, echinate; taste mild, odor none.

12. RUSSULA FLAVICEPS Peck, Ann. Rep. N. Y. State Mus. **53**: 843. 1900

Near Searsville Lake, California, *McMurphy 20,* December 28, 1902.

14. **Russula crenulata** sp. nov.

Pileus broadly convex, then plane to depressed, up to 9 cm. broad; surface milk-white or slightly yellow, viscid when moist, pellicle easily separable, glabrous; margin thin, slightly tuberculate-striate with age; context fragile, white, taste very acrid; lamellae white, equal, adnate, plane, edges appearing under the lens finely notched or crenate, not forking, rounded at the outer end, narrowed at the inner, pruinose, close; stipe white, spongy, nearly equal or enlarged below, glabrous, 10 cm. long, 2 cm. thick; spores white, mostly globose, echinulate, 10 μ in diameter.

Type collected at Glen Brook, Oregon, in a dense fir forest with a few oaks, November, 1911, *W. A. Murrill 762.* This species differs from *Russula albidula* Peck in its larger size; crenulate gills, which are broader and adnate rather than decurrent; in the absence of forking gills; and in the slightly tuberculate-striate margin.

15. **Russula Murrillii** sp. nov.

Pileus convex, becoming plane then depressed, up to 5 cm. broad; surface violaceous or darker in the center or entirely

darker, pruinose, becoming floccose-pruinose, evidently viscid when wet but soon dry; margin even; context white, thin, taste not noted; lamellae ochroleucous when fresh, becoming deeper yellow, equal, venose connected, rarely forking next to the stipe, rounded at the outer end, narrowly adnate at the inner end, subdistant, rather broad; stipe chalk-white, unchanging in drying, nearly equal, firm, stuffed, then tending to become hollow, glabrous; spores pale-yellow, echinulate, some globose, but many ellipsoid, $10 \times 7\ \mu$.

Type collected in fir forests with scattered specimens of oak, birch, willow, and maple, November 6, 1911, Corvallis, Oregon, *W. A. Murrill 965*. This species resembles *Russula azurea* Bres., but differs in the color of the pileus and the lamellae, which in *R. azurea* are white and remain white. It is a beautiful plant, characterized by its violet cap and pure-white stem. It is to be hoped that other collections of this species will soon be made and the taste recorded.

15. **Russula bicolor** sp. nov.

Pileus broadly convex, soon nearly plane, up to 8 cm. broad; surface coppery-red intermixed with pale-yellow or ocher, viscid when moist, pellicle separable on the margin, glabrous; margin even, becoming striate when mature; context white, subfragile, acrid to the taste; lamellae white, drying yellowish, equal, broad at the outer end, narrowed at the inner end but not free, interveined, subclose; stipe white, spongy, becoming hollow, 4.5 cm. long, 1.5 cm. thick or smaller; spores white, subglobose, echinulate.

Type collected under yellow birch in mixed woods, Newfane, Vermont, *Burlingham 39–1911*. Number *807, Murrill*, Oregon, seems to be the same.

16. RUSSULA PECTINATA (Bull.) Fries, Epicr. Myc. 358. 1838

Seattle, Washington, *Murrill 407*.

NEW YORK BOTANICAL GARDEN.

NEWS AND NOTES

The autumn meeting of the New York State Forestry Association was held at the Garden on October 17.

Dr. Ralph Jones has resigned from the Bureau of Plant Industry at Washington to become professor of botany at Emory College, Oxford, Georgia.

Professor W. C. Sturgis, formerly of the Connecticut Agricultural Experiment Station and now connected with Colorado College, visited the Garden October 15.

Mr. S. R. Winston, formerly assistant in plant pathology at the North Carolina Agricultural Experiment Station, has been appointed plant pathologist at the Hood River Branch Experiment Station in Oregon.

Mr. H. L. Rees has moved to the Western Washington Experiment Station, and Mr. G. H. Godfrey now fills the position vacated by Mr. Rees at the Oregon Agricultural Experiment Station.

Professor Adolf Engler, director of the Berlin Botanic Garden and senior author of the well-known systematic work on natural plant families, spent October 17 at the Garden, and met most of the local botanists socially in the evening at a dinner given in his honor.

Dr. E. D. Clark, known to the readers of MYCOLOGIA for his chemical investigations of the poisonous properties of certain fungi, has resigned his position in the Cornell Medical College to accept one in the Bureau of Chemistry at Washington.

Mr. L. O. Overholts, who holds a Lackland research fellowship at the Missouri Botanical Garden, spent six weeks during the past summer at Tolland, Colorado, collecting flowering plants and fungi. He expects to publish some account of his fungous collections in a few months.

A paper on the species of *Synchytrium* in the vicinity of Stanford University, by James McMurphy, appeared in the Dudley Memorial Volume of the Leland Stanford Junior University Publications for March, 1913. The following species are reported: *S. papillatum* Farlow, *S. innominatum* Farlow, *S. andinum* Lagh., and *S. Amsinckiae;* the last, occurring on *Amsinckia intermedia,* being described as new. *Urophlyctis pluriannulatus* Farlow is also reported.

A comparative study of the development of the fruit body in *Phallogaster, Hysterangium,* and *Gautieria* has been made by Mr. H. M. Fitzpatrick at Cornell University, and the results published in a recent number of *Annales Mycologici* with copious illustrations. The author discusses rather fully some of the latest opinions regarding the relationship and origin of the different large groups of gastromycetes and suggests that a careful developmental study be made also of *Dendrogaster, Protoglossum, Gymnoglossum,* and *Clathrogaster,* with a view to solving problems connected with the evolution of the gastromycetes. He outlines the following series as illustrating the origin of the Clathraceae: *Gautieria — Chamonixia — Hysterangium — Protubera — Phallogaster — Clathraceae* (*Clathrella Clathrus*).

Miss Adeline Ames has recently published in the *Annales Mycologici* an excellent paper on structure as related to genera in the Polyporaceae, illustrated with 4 plates, containing 76 figures. The genera recognized are *Polyporus, Bjerkandera, Ischnoderma, Cryptoporus, Piptoporus, Favolus, Porodisculus, Phaeolus, Coriolus, Trametes, Daedalea, Polystictus, Phellinus, Fomes,* and *Ganoderma.* Four of these are monotypic, and four others con-

tain very few species; so that most of the polypores are distributed among seven genera, according to this classification. The genus *Polyporus* is divided into four sections on the presence or absence of a stipe and the simple or duplex character of the trama. This will appeal to those who are accustomed to the old cumbersome arrangement adopted by Saccardo and who look upon a generic name as something sacred. Others, perhaps, who consider a genus simply as a group of species more closely related to each other than to any other group, will prefer a simpler and more modern system.

STERILITY IN PHOLIOTA CANDICANS (BULL.) SCHROET.

A very interesting sterile form of this species, ordinarily known as *Pholiota praecox,* appeared in 1910, 1911, and 1912 under a large white oak on the grounds of the New York Botanical Garden. The lamellae were exceedingly thin and remained white, as shown in the accompanying illustration. The sterility was absolute and without apparent cause. A few fertile sporophores were found scattered among the sterile ones as though arising from the same mycelium. It occurred to the writer that this subject might be a good one for investigation by some graduate student. In this particular case, also, there might be a chance to cultivate an early "seedless" variety of mushroom for the market which would not be discolored by spores nor expend its energies on producing spores instead of edible substance.

Other cases of sterility in gill-fungi have been noted rarely by mycologists. Dr. Peck mentions a case of sterility in *Psilocybe uda;* and Dr. B. O. Dodge tells me that he once collected two baskets full of a sterile species of *Clitopilus.* The abortions of *Clitopilus abortivus* and *Armillaria mellea* before the gills are formed are generally well-known, but the reason for them may not be so clear. Another class of abortions not accompanied by sterility is represented by *Abortiporus distortus* and various species of *Ptychogaster.*

W. A. MURRILL.

STERILE FORM OF PHOLIOTA CANDICANS (BULL.) SCHROET.

THE GENUS SYNCHYTRIUM[1]

This monograph represents several years of careful and painstaking work on the genus, which was founded by De Bary and Woronin in 1863 for two species, *S. Taraxaci* and *S. Succsiae.* The morphology, cytology, biology, and relation of the fungus to its host are treated in detail both by a review of the extensive literature and from original studies. The taxonomic portion of the paper shows marked conservatism, both by the retention of species such as *S. pluriannulatum,* which recently have been transferred to other genera, and by following the older systems of classification. The genus is divided into two subgenera, *Eusynchytrium,* to which 9 species are assigned, and *Haplochytrium* (the genus *Pycnochytrium* Schröter) with 17 species. Of the remaining species, 25 are not distributed and 12 are classed as doubtful. No further comment is necessary concerning the need of additional life history studies on species of the genus. Of the 63 species included, 3 are new. While *S. aureum* possesses an array of 130 hosts and numerous named forms, no member of the genus can be called cosmopolitan, at least from the data given. The geographical distribution is as follows: North America 21 species, South America 7, Europe 35, Asia 5, Africa 3, Australia 2, and New Zealand 1. Of the North American species, 12 are endemic, 8 are also found in Europe, 2 in Africa, and 1 in Australia. The excellent plates, the indexes, and the careful treatment of the subject matter will make this work of great value to all students of the lower fungi.

GUY WEST WILSON.

A BAD YEAR FOR FLESHY FUNGI

The past season has been peculiarly unfavorable for the growth of fleshy fungi in the region about New York. The heavy rains late in September and October brought out certain species in great numbers, but they came too late for most of the summer and early autumn forms.

The shaggy-mane, *Coprinus comatus,* occurred again this year

[1] Die Synchytrien. Studien zu einer Monographie der Gattung. Von Dr. Gertrud Tobler geb. Wolff. Archiv fü Protistenkunde **28**: 141–238, *pl. 10–13,* 1913. Also issued as a repaged separate, 8°. pp. 98, *pl. 4.* 1913.

as it did last year in the greatest abundance on a new street east of the New York Botanical Garden which was heavily surfaced with topsoil and allowed to grow up in weeds. Under similar conditions, Mr. George E. Pollock found great quantities of this species at Holmesdale, Massachusetts, growing in tufts almost as close as those of *Coprinus atramentarius.*

The giant puffball, *Calvatia maxima,* also appears to have been unusually abundant this year. One specimen was found on the grounds of the Garden, and a very attractive group developed in Mr. Boeder's yard in Williamsbridge, just north of the Garden reservation. Photographs of this group made by Mrs. Boeder have been added to the mycological collection. Another recent addition is a photograph of a giant puffball from Sendai, Japan, taken by Professor A. Yasuda.

The common field puffball, *Calvatia cyathiformis,* about the size of one's fist and very safe for the amateur mycophagist, was abundant early in October.

Pleurotus ulmarius has been more abundant than usual, growing from knotholes and wounds in elm trees. The white elm has suffered greatly in this vicinity from the attacks of the leaf-beetle, borer, and other causes. In its weakened condition, it cannot easily withstand the invasion of fungi.

The fly agaric, *Amanita muscaria,* appeared in greater abundance than ever before, under the white pines on the grounds of the Garden. Yellow forms prevailed, while many specimens were almost white, and very few showed a decided orange tint. Many years ago, the Italian immigrants are said to have eaten this species by mistake for *Amanita Caesarea,* but there is no evidence that they do this now. The large number of deaths from mushroom eating in New York in recent years has undoubtedly been due to mistaking the white form of *Amanita phalloides* for the ordinary field mushroom or some other edible fungus. *Armillaria mellea,* when growing singly in soil, might at times be confused with a pale form of *Amanita muscaria* by ignorant collectors, who would hardly notice the cottony ring of the former and the patches instead of scales on the surface of the latter.

W. A. MURRILL.

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